भारतीय मानक
Indian Standard

IS 13730 (Part 5) : 2018

कुंडलण तारों के विशेष प्रकार की विशिष्टियाँ

भाग 5 पॉलिएस्टर इनैमलकृत गोल एल्यूमिनियम के तार, वर्ग 155

Specification for Particular Types of Winding Wires

Part 5 Polyester Enamelled Round Aluminium Wire, Class 155

ICS 29.060.10

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September 2018 **Price Group 2**

Winding Wires Sectional Committee, ETD 33

FOREWORD

This Indian Standard (Part 5) was adopted by the Bureau of Indian Standards, after the draft finalized by the Winding Wires Sectional Committee had been approved by the Electrotrchnical Division Council.

This Indian Standard is to be read in conjunction with IS 13730 (Part 0/Sec 3) : 2012 'Specification for particular type of winding wires: Part 0 General requirements, Section 3 Enamelled round aluminium wire (*first revision*)' For the sake of convenience, the clauses of this standard correspond to those of IS 13730 (Part 0/ Sec 3). Instead of reproducing full text of each clause, clauses of IS 13730 (Part 0/Sec 3) which are applicable (which means that relevant provision of the clause apply) or not applicable are indicated as under:

a) In case of clause where it in applicable, the wording used is 'This clause of IS 13730 (Part 0/ Sec 3) is applicable', and

b) In case of clause where it is not applicable, the wording use is 'This clause of IS 13730 (Part 0/Sec 3) is not applicable.

In this standard, clause numbers from **24** to **29** are missing as these clause numbers are missing in IS 13730 (Part 0/Sec 3) : 2012 also.

The composition of the Committee, responsible for the formulation of this standard is given at Annex A.

For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated expressing the result of a test or analysis, shall be rounded off in accordance with IS 2 : 1960 'Rules for rounding off numerical values (*revised*).' The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

Indian Standard

SPECIFICATION FOR PARTICULAR TYPES OF WINDING WIRES

PART 5 POLYESTER ENAMELLED ROUND ALUMINIUM WIRE, CLASS 155

1 SCOPE

1.1 This standard (Part 5) specifies the requirements of enamelled round aluminium winding wire of class 155 with a sole coating based on polyester resin, which may be modified providing it retains the chemical identity of the original resin and meets all specified wire requirements.

NOTE — A modified resin is a resin that has undergone a chemical change, or contains one or more additives to enhance certain performance or application characteristics.

Class 155 is a thermal class that requires a minimum temperature index of 155 and a heat shock temperature of at least 175°C.

The temperature in degrees Celsius corresponding to the temperature index is not necessarily that at which it is recommended that the wire be operated and this will depend on many factors, including the type of equipment involved.

1.2 The range of nominal conductor diameters covered by this standard is as follows:

a) Grade 1: 0.250 mm up to and including 2.500 mm; and
b) Grade 2: 0.250 mm up to and including 2.500 mm.

The nominal conductor diameters are specified in **4** of IS 13730 (Part 0/Sec 3).

2 REFERENCE

The standard given below contains provisions which, through reference in this text, constitute provisions of this standard. At the time of publication, the edition indicated was valid. All standards are subject to revision, and parties to agreements based on this standard are encouraged to investigate the possibility of applying the most recent edition of the standard indicated below:

IS No.	*Title*
13730 (Part 0/ Sec 3) : 2012	Specification for particular types of winding wires : Part 0 General requirements, Section 3 Enamelled round aluminium wires is necessary adjunct to this standard

3 TERMINOLOGY AND GENERAL NOTES ON METHOD OF TEST

3.1 Terminology

For the purpose of this standard, the definitions given in **3.1** of IS 13730 (Part 0/Sec 3) shall apply.

3.2 General Notes on Methods of Test

For general notes on methods of test, *see* **3.2** of IS 13730 (Part 0/Sec 3). In case of inconsistencies between IS 13730 (Part 0/Sec 3) and this standard, IS 13730 (Part 0/Sec 3) shall prevail.

4 DIMENSIONS

This clause of IS 13730 (Part 0/Sec 3) is applicable.

5 ELECTRICAL RESISTANCE

This clause of IS 13730 (Part 0/Sec 3) is applicable.

6 ELONGATION

This clause of IS 13730 (Part 0/Sec 3) is applicable.

7 SPRINGINESS

This clause of IS 13730 (Part 0/Sec 3) is applicable.

8 FLEXIBILITY AND ADHERENCE

This clause of IS 13730 (Part 0/Sec 3) is applicable.

9 HEAT SHOCK

This clause of IS 13730 (Part 0/Sec 3) is applicable, where the minimum heat shock temperature shall be 175°C.

10 CUT THROUGH

No failure shall occur within 2 min at 270°C.

11 RESISTANCE TO ABRASION

11.1 The test shall be applicable for nominal conductor diameter from 0.250 mm upto and including 2.500 mm.

11.2 The wire shall meet the requirements given in Table 1.

12 RESISTANCES TO SOLVENTS

This clause of IS 13730 (Part 0/Sec 3) is applicable.

13 BREAKDOWN VOLTAGE

This clause of IS 13730 (Part 0/Sec 3) is applicable, where the elevated temperature shall be 175°C.

Table 1 Resistance to Abrasion

(*Clause* 11.2)

Nominal Conductor Diameter mm	**Grade 1**		**Grade 2**	
	Minimum Average Force to Failure N	Minimum Force to Failure of Each Measurement N	Minimum Average Force to Failure N	Minimum Force to Failure of Each Measurement N
(1)	(2)	(3)	(4)	(5)
0.250	1.35	1.15	—	—
0.280	1.45	1.25	—	—
0.315	1.060	1.35	—	—
0.400	1.85	1.55	3.00	2.55
0.450	1.95	1.65	3.25	2.75
0.500	2.10	1.30	3.45	2.95
0.560	2.25	1.90	3.70	3.15
0.630	2.45	2.05	3.95	3.35
0.710	2.60	2.20	4.25	3.60
0.800	2.80	2.35	4.55	3.85
0.900	3.00	2.55	4.85	4.10
1.000	3.30	2.80	5.20	4.40
1.120	3.50	3.00	5.50	4.70
1.250	3.80	3.25	5.95	5.00
1.400	4.10	3.50	6.35	5.40
1.600	4.45	3.80	6.85	5.80
1.800	4.80	4.10	7.35	6.20
2.000	5.15	4.40	7.85	6.65
2.240	5.55	4.7	8.35	7.10
2.500	5.95	5.05	8.90	7.55

14 CONTINUITY OF INSULATION

This clause of IS 13730 (Part 0/Sec 3) is applicable.

15 TEMPERATURE INDEX

This clause of IS 13730 (Part 0/Sec 3) is applicable, where the minimum temperature index shall be 175.

16 RESISTANCE TO REFRIGERANTS

This clause of IS 13730 (Part 0/Sec 3) is applicable.

17 SOLDERABILITY

This test is not applicable.

18 HEAT OR SOLVENT BONDING

This clause of IS 13730 (Part 0/Sec 3) is applicable.

19 DIELECTRIC DISSIPATION FACTOR

This clause of IS 13730 (Part 0/Sec 3) is applicable.

20 RESISTANCE TO TRANSFORMER OIL

This clause of IS 13730 (Part 0/Sec 3) is applicable.

21 LOSS OF MASS

This clause of IS 13730 (Part 0/Sec 3) is applicable.

22 HIGH TEMPARATURE FAILURE

This test is not applicable.

23 PIN HOLE TEST

The requirements for this test is under consideration.

24 PACKAGING

This clause of IS 13730 (Part 0/Sec 3) is applicable.

25 BIS CERTIFICATION MARKING

The protective glove may also be marked with the Standard Mark.

25.1 The use of the Standard Mark is governed by the provisions of the *Bureau of Indian Standards Act*, 2016 and Rules and Regulations made thereunder. The details of the conditions under which a license for the use of the Standard Mark may be granted to manufacturers or producers may be obtained from the Bureau of Indian Standards.

ANNEX A

(*Foreword*)

COMMITTEE COMPOSITION

Winding Wires Sectional Committee, ETD 33

Organization	*Representative(s)*
Bharat Heavy Electricals Ltd, Noida	Shri Ratnanav Acharya (***Chairman***)
Bharat Heavy Electricals Ltd, Hyderabad	Shri J. M. Jagadishwar Rao Shri Laxmi Rajam M. (*Alternate*)
Central Electricity Authority, New Delhi	Shri Vivek Goel Shri Faraz (*Alternate*)
CG Power & Industrial Solutions Ltd, Ahmednagar	Shri Agnihotri S. D. Shri Nadkarni M. P. (*Alternate*)
Central Power Research Institute, Bengaluru	Dr. M. Moumita Naskar
Development Commissioner Micro, Small & Medium Enterprises, New Delhi	Dr. S. K. Sahoo Shri Dhanendra Prasad (*Alternate* I) Shri S. K. Saini (*Alternate* II)
Ministry of Defence, New Delhi	Brig M. M. S. Bharaj Col P. P. Singh (*Alternate*)
Elantas Beck India Ltd, Pune	Shri Bapu Gowade Ms Rakhee Telkar (*Alternate*)
Electrical Research & Development Association, Vadodara	Shri Shailesh Patel Shri Sheetal Panchal (*Alternate*)
International Copper Association Ltd, New Delhi	Shri Abhishek Dhupar Shri Sanjeev Ranjan (*Alternate*)
IEEMA, New Delhi	Shri Pragati Sohoni Shri Pande J. (*Alternate*)
Kirloskar Electric Company Ltd, Bengaluru	Shri Umesh G. Principal
Larsen & Toubro Ltd, Ahmednagar	Shri Sudhir R. Kulkarni Shri Rajesh P. Sawant (*Alternate* I) Shri Kevin J. Fernandes (*Alternate* II)
National Test House, Ghaziabad	Shri Jeyraj K. Principal Shri A. S. Negi (*Alternate*)
Precision Wires India Ltd, Mumbai	Shri Milan M. Metha
Ram Ratna Wires Ltd, Silvassa	Shri Vijay L. Chandak
Sanmar Speciality Chemicals Ltd, Kolkata	Shri Choudhury M.
South India Engineering Manufacturers Association, Coimbatore	Shri Keshavarajulu R. G. Shri Rajendran G. (*Alternate*)
Siemens Ltd, Mumbai	Shri Ashish Shere
Winding Wires Association of India, Noida	Shri Sudhir Agarwal Shri Anant Loya (*Alternate*)
BIS Directorate General	Shri Rajeev Sharma, Scientist 'F' and Head (MED) [Representing Director General (*Ex-officio*)]

Member Secretary
Shri Sudheer Bishnoi
Scientist 'E' (ETD) BIS

Bureau of Indian Standards

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Amendments Issued Since Publication

Amend No.	Date of Issue	Text Affected

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